WE CLAIM:

1. A variable optical device for selectively controlling propagation of light within an optical waveguide, the optical device comprising:

a relief modulation defining a grating disposed proximal the waveguide and having a respective grating index of refraction n_G;

a matrix surrounding at least the relief modulation, the matrix having an index of refraction n_{EO} that is controllable, in response to a selected stimulus between a first value that is substantially equal to the grating index of refraction n_G, and a second value; and

at least one electrode for supplying the selected stimulus to the matrix.

2. An optical device as claimed in claim 1, wherein the relief modulation is disposed relative to the waveguide so as to interact with any one or more of:

core modes of light propagating within the wavelguide;

an evanescent field of light propagating within the wavelguide; and

cladding modes of light propagating within the waveguide.

3. An optical device as claimed in claim 1, wherein the relief modulation comprises any one or more of: chirped; apodized; and blazed relief modulations.

4. An optical device as claimed in claim 1, wherein the relief modulation is formed in a cladding layer of the optical waveguide.

5. An optical device as claimed in claim 1, wherein the relief modulation is formed in a substrate positioned proximal the waveguide.

6. An optical device as claimed in claim 1, wherein the grating index of refraction n_G is substantially fixed.

7. An optical device as claimed in claim 6, wherein the grating index of refraction n_G is substantially equal to a cladding index of refraction n_{CLAD} of a cladding layer of the waveguide.

8. An optical device as claimed in claim 1, wherein the grating index of refraction n_G is variable in response to a predetermined stimulus.

9. An optical device as claimed in claim 8, wherein a sign of change of the grating refractive index n_G in response to the stimulus is opposite the sign of change of the matrix refractive index n_{EO} in response to the stimulus.

10. An optical device as claimed in claim 9, wherein an average refractive index of the grating and the matrix is substantially constant.

11. An optical device as claimed in claim 1, wherein the at least one electrode comprises an array of

electrodes adapted to generate an arbitrary electric field in the vicinity of the grating.

12. An optical device as claimed in claim 11, wherein the electrodes are positioned out of contact with an evanescent field of light propagating in the waveguide core.

13. An optical device as claimed in claim 1, further comprising two or more relief modulations defining respective gratings, each grating being associated with at least one respective electrode.

14. An optical device as claimed in claim 13, wherein at least one grating is oriented relative to the waveguide differently from at least one other grating.

15. An optical device as claimed in claim 1, further comprising:

a first mode converter disposed upstream of the relief modulation for converting core modes into cladding modes; and

a second mode converter disposed downstream of the relief modulation for converting cladding modes into core modes

16. An optical device as claimed in claim 1, wherein the relief modulation is oriented at an angle relative to a core of the waveguide, such that light reflected by the relief modulation is at least partially out-coupled from the core.

17. An optical device as claimed in claim 16, further comprising a photodetector disposed to receive at least a portion of the out-coupled light.